



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/829,175

04/22/2004

Hans-Josef Sterzel

PF 54487

5942

26474 7590 08/09/2007  
NOVAK DRUCE DELUCA & QUIGG, LLP  
1300 EYE STREET NW  
SUITE 1000 WEST TOWER  
WASHINGTON, DC 20005

EXAMINER

VIJAYAKUMAR, KALLAMBELLA M

ART UNIT

PAPER NUMBER

1751

MAIL DATE

DELIVERY MODE

08/09/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/829,175	<b>Applicant(s)</b> STERZEL, HANS-JOSEF	
	<b>Examiner</b> Kallambella Vijayakumar	<b>Art Unit</b> 1751	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 02/27/2007.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-8 and 10 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8 and 10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

Art Unit: 1751

### **Detailed Action**

Claims 1-8 and 10 as amended are currently pending with the application. Claims 1, 3-5 and 8 were amended. Claim-9 was previously cancelled.

Applicant's amendment overcomes the rejection of claims 1 and 4-5 under 35 USC 112-II paragraph and the prior art by Amatucci (US 2002/0102205).

### **Claim Objections**

Claims 4-5 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

Claim 4 recites the limitation of "first component for the reaction forming water of reaction" in Line-3 that is not further limiting the components in claim-1.

Claim 5 recites the limitation of "first component to a second component for the reaction forming water of reaction" in Line 3 that is not further limiting the components claim-1.

Applicants are suggested to include the identified first and second components as essential components in the claim-1 to overcome these objections.

### **Claim Rejections - 35 USC § 102**

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Art Unit: 1751

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

1. Claims 8 and 10 rejected under 35 U.S.C. 102(b) as being anticipated by Kavan et al (ECS, 2002, 5(2) A39-A42).

Kavan et al teaches the composition of a nanocrystalline  $\text{Li}_4\text{Ti}_5\text{O}_{12}$  spinel electrode material a particle size of about 4-5 nm and a battery comprising the spinel composition (Pg-A40, Fig-1; C-2, Para-3). The prior art composition is either same or substantially same as that claimed by the applicant's and "[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." In re Thorpe, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985). All the limitations of the instant claims are met.

The reference is anticipatory.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966),

that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.

Art Unit: 1751

3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

1. Claims 1-8 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kavan et al (ECS, 2002, 5(2) A39-A42) further in view of either Bruno et al (US 5,242,674) or Idota (US 5,571,637).

Kavan et al teaches the synthesis of nanocrystalline  $\text{Li}_4\text{Ti}_5\text{O}_{12}$  spinel electrode material by reacting lithium ethoxide and Ti(IV)-alkoxide in an alcoholic media and a battery containing the spinel (Abstract, Fig-4A). The composition of the Li-Ti-O spinels was represented by the formula  $\text{Li}_{1+x}\text{Ti}_{2-x}\text{O}_4$ ;  $0 \leq x \leq 1/3$  (Pg A-39; C-1, Para1-2; Pg-A41, Fig-4). The prior art teaches mixing the components and hydrolyzing with water and concentrating the contents to a concentration of 10-20 wt% at 40°C and 20 mbar pressure, adding PEG and coating a glass substrate followed by calcination at 500°C for 30 mins (Pg A39, Experimental). The formation of water due to the decomposition of alkoxide and/or the hydroxide in the process would meet the limitation of "water of reaction" in claim-1.

The prior art is silent about using other precursors of Li such as Li-hydroxide in making the mixed oxide composition per claim-1, and the process conditions per the claims 3-5 and particle size per claim-7.

In the analogous art of mixed metal oxides, Bruno et al teach making mixed metal oxides by reacting Li salts such as Li-OH and Li-acetate (organic salt of Li) with organometallic salts of metals such as alkoxides and acetylacetonates of Ti in presence of alcohol and optimizing the particle size of resultant mixed oxide by controlling the process temperature and the elemental ratios (C-1, Ln 20-43, C-2, Ln 30-40, 56-60; C-4, Ln 30-40; C-7, Ln 46-57).

In the analogous art of electrode/batteries, Idota teaches making positive electrode materials with spinel structure by reacting Li salts such as Li-OH and Li-oxo-acid salts (organic salt of Li) with organometallic salts of metals such as acetylacetonates of Ti. The particle size of the electrode material ranged from 0.1-50 micron (C-7, Ln 27-30; C-3, Ln 12-50; C-4, Ln 60-65).

It would be obvious to a person of ordinary skilled in the art to combine the prior art teachings to substitute the Li-ethoxide of Kavan et al with Li-hydroxide in the making of the Li-Ti-O as functional

Art Unit: 1751

equivalent with reasonable expectation of success, because the prior art teachings are in the analogous art of mixed oxides and/or electrodes, and because Kavan discloses that Li-carbonate/hydroxide can be used in the synthesis of nanocrystalline Li-Ti-O spinel (Pg-A39, Para-3; Pg-A40, Results and Discussion, Col-1).

With regard to claims 3-5 and 7, the prior art teaches making the composition at 40C and 20 mbar or hydrothermally at 150C with a particle size of approximately 9 nm. Also, with respect to the temperature, pressure and concentration, the optimization and selection of such reaction parameters would have been obvious to one of ordinary skill in the art at the time the invention was made because reaction parameters are recognized to have been result-effective variables. As to optimization results, a patent will not be granted based upon the optimization of result effective variables when the optimization is obtained through routine experimentation unless there is a showing of unexpected results which properly rebuts the *prima facie* case of obviousness. See *In re Boesch*, 617 F.2d 272, 276, 205 USPQ 215, 219 (CCPA 1980). See also *In re Woodruff*, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936-37 (Fed. Cir. 1990), and *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). With regard to claim-7, the particle size of approximately 9 nm encompasses particles with a diameter both a little smaller than 9 nm and a little larger than 9 nm in the gaussian distribution of particle sizes that would either touch or lie inside the claimed range of 2-8 nm that is in close proximity of prior art 9 nm, and In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a *prima facie* case of obviousness exists. In *re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); *In re Woodruff*, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990).

With regard to claims 8 and 10, the prior art teaches a particle size of about 4-5 nm and an electrode comprising the composition (Pg-A40, Fig-1; C-2, Para-3). The prior art composition is similar to that by the applicant's and "[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985).

### ***Double Patenting***

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-3 and 7 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-5 of U.S. Patent No. 7,208,135 (previously SI No. 10/847,620, claims 1,3 and 6-9). Although the conflicting claims are not identical, they are not patentably distinct from each other because they are drawn to a process of making mixed metal oxides starting from similar components and reacting at similar conditions and forming products with similar particle size. The Ti-alkoxide and Li-hydroxide of instant application is encompassed by the components in the patent. The instant application differs from the patent in that it requires preparing a spinel by the formation of water of reaction that would be obvious over similar process operating parameters on similar components.

### ***Response to Arguments***

Applicant's arguments filed 02/27/2007 have been fully considered but they are not persuasive. With regard to the argument that Kavan's particle size measurement by BET and X-ray reflection is subject to large errors is argumentative and not factual (Res Pg-5, Para-4). Further, Kavan discloses approximately 9 nm particle size that lies inside the instant claimed 1-10 nm, and in the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists. *In re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); *In re Woodruff*, 919 F.2d 1575, 16

Art Unit: 1751

USPQ2d 1934 (Fed. Cir. 1990). Applicants argument about Claim-7 as amended has been addressed in the rejection under 35 USC 103(a).

For the reasons set forth above, applicant's fail to distinguish their process and the product by process product over the prior art.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kallambella Vijayakumar whose telephone number is 571-272-1324. The examiner can normally be reached on 8.30-6.00 Mon-Thu, 8.30-5.00 Alt Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Douglas McGinty can be reached on 571-272-1029. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



Art Unit: 1751

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/KMV/  
Aug 01, 2007.

  
DOUGLAS MCGINTY  
SUPERVISORY PATENT EXAMINER

1751